

SEQUENCE LISTING

<110> Chen, Yih-Tai
Cao, Longguang

<120> A synthetic DNA encoding an orange seapen-derived green fluorescent protein
with codon preference of mammalian expression systems and biosensors

<130> 41856-5

<160> 27

<170> PatentIn version 3.1

<210> 1

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<212> DNA

<213> Ptilosarcus gurneyi

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tacgaggcga acctgggtt cggacggc gccatcggtt acatccggag cgacatcagc 240
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360
420
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ggcaacccggct	tcccttagcaa	cgcccccgtg	atgcagaagg	ccatccctggg	catggagccc	1200
agcttcgagg	tggtgttacat	gaacacggcc	gtgtctgggtgg	gcggagggtgg	cctgtgttac	1260
aagctggaga	gcggcaacta	ctacagctgc	cacatgaaga	ccttctaccg	gagcaaggcc	1320
ggcggtggaa	agtcccttga	gttacccattc	atccaccacc	ggctggagaa	gaactacgtg	1380
gaggaggggca	gcttcgtggaa	gcggcacgag	accggccatcg	cccaggctgac	caccatcgcc	1440
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<213> Ptilosarcus gurneyi

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25

Met Glu Gly Phe GLY Lys GLY Asn Val Leu Phe GLY Asn Gln Leu Met
35 40

Gln Ile Arg Val Thr Lys GLY GLY Pro Leu Pro Phe Ala Phe Asp Ile
50 55

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105
110

Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Ser	Asn	Gly	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile	
115																						125
Arg	Gly	Asn	Gly	Phe	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile						
130																						140
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val							
145																						155
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Val							
																						165
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys							
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Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	Arg	Leu	Glu	Lys	Thr	Tyr								
																						185
Val	Glu	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln							
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Leu	Thr	Thr	Ile	Gly	Lys	Pro	Leu	Gly	Ser	Leu	His	Glu	Trp	Val								
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp GLY Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Ptilosarcus gurneyi. ST25.txt

He was a man of great energy and determination, and he left a lasting legacy in the field of education.

145 Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

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<212> PRT
<213> *Ptilosarcus gurneyi*

...ly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu GLY Ile Val
5 10 15

Ptilosarcus gurneyi.ST25.txt

Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn Val Leu
20
25

Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys GLY GLY Pro Leu
35
40

Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg
50
55

Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser
65
70

Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly
85
90

Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe
100
105

His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro
115
120

Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe Glu Val Val
130
135

Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu Val Tyr Lys

Ptilosarcus gurneyi. ST25.txt

160

— 5 —

150

145

Ser Lys Gly GLY Val Lys Glu Phe Pro Glu Tyr His Phe Ile His His
180 185 190

Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val Glu Gln His
195 196 197 198 199 200 201 202 203 204 205

Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly
210 215

<210> 5

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<213> Ptilosarcus gurneyi

5

Met Val Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser 15

Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met
20 25 30

Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln

45

35

Ile Arg Val Thr Lys GLY GLY Pro Leu Pro Phe Ala Phe Asp Ile Val
50 55 60

Ser Ile Ala Phe Gln Tyr GLY Asn Arg Thr Phe Thr Lys Tyr Pro Asp
65 70 75 80

Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr
85 90 95

Glu Arg Asn Leu Arg Phe Glu Asp GLY Ala Ile Val Asp Ile Arg Ser
100 105 110

Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg
115 120 125

Gly Asn GLY Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu
130 135 140

GLY Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser GLY Val Leu
145 150 155 160

Val GLY Glu Val Asp Leu Val Tyr Lys Leu Glu Ser GLY Asn Tyr Tyr
165 170 175

Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Glu Val Lys Glu
180 185 190

Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val
195 200 205

Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu
210 215 220

Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<213> Ptilosarcus gurneyi

<400> 6

Met Val Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala
1 5 10 15

Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu
20 25 30

Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile
35 40 45

Ptilosarcus gurneyi.ST25.txt

Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu
195 200 205

Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr
210 215 220

Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

<210> 7
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<212> PRT
<213> Ptilosarcus gurneyi

<400> 7

Met Val Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys
1 5 10 15

Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly
20 25 30

Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg
35 40 45

Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile
50 55 60

Ptilosarcus gurneyi: ST25.txt

Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile
65 70 75 80

Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg
 85 90 95

Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr	Arg	Gly	Asn
115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130

Gly Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met
130 135 140

145 Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly
150 155 160

Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys
165 170 175

Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr
210 215 220

Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<213> Ptilosarcus gurneyi

<400> 8

Met Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala
1 5 10 15

Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe
20 25 30

Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val
35 40 45

Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala
50 55 60

Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala
65 70 75 80

Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys Glu Phe Pro Glu

Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn
85 90 95

Leu Arg Phe Glu Asp GLY Ala Ile Val Asp Ile Arg Ser Asp Ile Ser
100 105 110 115

Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn GLY
115 120 125

Phe Pro Ser Asn GLY Pro Val Met Gln Lys Ala Ile Leu GLY Met Glu
130 135 140

Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Gly Glu
145 150 155 160

Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His
165 170 175

Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys Glu Phe Pro Glu
180 185 190

Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu GLY
195 200 205

Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile

Ptilosarcus gurneyi. ST25.txt

215 220

210

Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu

Ptilosarcus gurneyi.ST25.txt

85 Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu
100 90 105 110

Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe
115 120 125

Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro
130 135 140

Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val
145 150 155 160

Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met
165 170 175

Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys Glu Phe Pro Glu Tyr
180 185 190 195

His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser
195 200 205

Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly
210 215 220

Lys Pro Leu Gly Ser Leu His Glu Thr Val
225 230

<210> 10
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<213> Ptilosarcus gurneyi

<400> 10

Met Val Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val
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Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys
20 25 30

Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys
35 40 45

Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln
50 55 60

Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr
65 70 75 80

Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg
85 90 95

Phe	Glu	Asp	Gly	Ala	Ile	Vall	Asp	Ile	Arg	Ser	Asp	Ile	Ser	Leu	Glu	
100																110
Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr	Arg	Gly	Asn	Gly	Phe	Pro	
115																125
Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile	Leu	Gly	Met	Glu	Pro	Ser	
130																140
Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val	Leu	Val	Gly	Glu	Val	Asp	
145																155
Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr	Tyr	Ser	Cys	His	Met	Lys	
165																175
Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys	Glu	Phe	Pro	Glu	Tyr	His	
180																185
Phe	Ile	His	His	Arg	Ile	Glu	Lys	Thr	Tyr	Val	Glu	Glu	Gly	Ser	Phe	
195																200
Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln	Leu	Thr	Thr	Ile	Gly	Lys	
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Pro	Leu	Gly	Ser	Leu	His	Glu	Trp	Val								
225																230

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<213> Ptilosarcus gurneyi

<400> 11

Met Val Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu
1 5 10 15

Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly
20 25 30

Asn Val Leu Phe GLY Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly
35 40 45

Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr
50 55 60

Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe
65 70 75 80

Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe
85 90 95

Glu Asp GLY Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp
100 105 110

Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser
115 120 125

Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe
130 135 140

Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu
145 150 155 160

Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr
165 170 175

Phe Tyr Arg Ser Lys Gly Val Lys Glu Phe Pro Glu Tyr His Phe
180 185 190

Ile His Arg Leu Glu Lys Thr Tyr Val Glu Gly Ser Phe Val
195 200 205

Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile GLY Lys Pro
210 215 220

Leu Gly Ser Leu His Glu Trp Val
225 230

<210> 12
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<213> Ptilosarcus gurneyi

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Met Val Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu Gly
1 5

Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn
20 25

Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly Gly
35 40

Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly
50 55

Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val
65 70

Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu
85 90

Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp
100 105

Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn
115 120
125

Gly	Pro	Val	Met	Gln	Lys	Ala	Ile	Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu
130				135								140			
Val	Val	Tyr	Met	Asn	Ser	Gly	Val	Leu	Val	Gly	Val	Asp	Leu	Val	
145				150								155			160
Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr	Tyr	Ser	Cys	His	Met	Lys	Thr	Phe
							165			170				175	
Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys	Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile
							180			185				190	
His	His	Arg	Leu	Glu	Lys	Thr	Tyr	Val	Glu	Gly	Ser	Phe	Val	Glu	
							195			200				205	
Gln	His	Glu	Thr	Ala	Ile	Ala	Gln	Leu	Thr	Ile	Gly	Lys	Pro	Leu	
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Gly	Ser	Leu	His	Glu	Trp	Val									
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<400> 13

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110 115

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile

Ptilosarcus gurneyi.ST25.txt

130		135		140												
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val	
145		150		155		160										
Leu	Val	Gly	Glu	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr
						165			170							175
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys	
					180			185			190					
Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	His	Arg	Leu	Glu	Lys	Thr	Tyr	
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Val	Glu	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln	
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Met	Val	Asn	Arg	Asn	Val	Leu	Lys	Asn	Thr	Gly	Leu	Lys	Glu	Ile	Met	
1					5					10						15
Ser	Ala	Lys	Ala	Ser	Val	Glu	Gly	Ile	Val	Asn	Asn	His	Val	Phe	Ser	

20

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met

35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125Arg Gly Asn GLY Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Ptilosarcus gurneyi.ST25.txt

Leu Val Gly Glu Val Asp Leu Val 165
170

Tyr Ser Cys His Met Lys Thr Phe Tyr 180
185

Glu Phe Pro Glu Tyr His Phe Ile His Tyr 195
200

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln 210
215
220

Leu
225

<210> 15
<211> 226
<212> PRT
<213> Ptilosarcus gurneyi

<400> 15

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met 1
5
10
15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser 20
25
30

Met	Glu	Gly	Phe	Gly	Lys	Gly	Asn	Val	Leu	Phe	Gly	Asn	Gln	Gln	Leu	Met	
35																	
Gln	Ile	Arg	Val	Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile		
50																	
Val	Ser	Ile	Ala	Phe	Gln	Tyr	Gly	Asn	Arg	Thr	Phe	Thr	Lys	Tyr	Pro		
65																	
Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe		
85																	
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg		
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr		
115																	
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile		
130																	
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val		
145																	
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr		
165																	

Ptilosarcus gurneyi.ST25.txt

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr
225

<210> 16
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<400> 16

Met Val Asn Arg Asn Val Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu GLY Phe GLY Lys GLY Asn Val Leu Phe GLY Asn Gln Leu Met
35 40 45

Gln	Ile	Arg	Val	Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile
50															
Val	Ser	Ile	Ala	Phe	Gln	Tyr	Gly	Asn	Arg	Thr	Phe	Thr	Lys	Tyr	Pro
65															
Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr	
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200
205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215
220

Leu Thr Thr
225

<210> 17
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<400> 17

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
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10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25
30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40
45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55
60

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Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

145 Ileu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
150 155 160

Leu Val GLY Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr

195

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220Leu Thr Thr Ile
225<210> 18
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<212> PRIT
<213> Ptilosarcus gurneyi

<400> 18

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20 25 30Met Glu GLY Phe GLY Lys GLY Asn Val Leu Phe GLY Asn Gln Leu Met
35 40 45Gln Ile Arg Val Thr Lys GLY GLY Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr GLY Asn Arg Thr Phe Thr Lys Tyr Pro

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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly
225

<210> 19
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<400> 19

Met Val Asn Arg Asn Val Leu Lys Asn Thr GLY Leu Lys Glu Ile Met
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Ser Ala Lys Ala Ser Val Glu GLY Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu GLY Phe GLY Lys GLY Asn Val Leu Phe GLY Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys GLY GLY Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr GLY Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe
85	85	85	85	85	85	85	85	90	90	90	90	90	95	95	95
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg
100	100	100	100	100	100	100	105	105	105	105	105	110	110	110	110
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr
115	115	115	115	115	115	115	120	120	120	120	120	125	125	125	125
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
130	130	130	130	130	130	130	135	135	135	135	140	140	140	140	140
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val
145	145	145	145	145	145	145	150	150	150	155	155	160	160	160	160
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr
165	165	165	165	165	165	165	170	170	170	170	175	175	175	175	175
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys
180	180	180	180	180	180	180	185	185	185	185	190	190	190	190	190
Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	His	Arg	Leu	Glu	Lys	Thr	Tyr
195	195	195	195	195	195	195	200	200	200	205	205	205	205	205	205
Val	Glu	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln
210	210	210	210	210	210	210	215	215	215	220	220	220	220	220	220

Leu Thr Thr Ile GLY Lys
225 230

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<400> 20

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg
100															
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr
115															
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
130															
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val
145															
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr
165															
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys
180															
Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	His	Arg	Leu	Lys	Thr	Tyr	
195															
Val	Glu	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln
210															
Leu	Thr	Thr	Ile	Gly	Lys	Pro									
225															

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<400> 21

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr
115															
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
130															
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val
145															
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr
165															
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys
Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	His	Arg	Leu	Glu	Lys	Thr	Tyr
195															
Val	Glu	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln
210															
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225															
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<400> 22

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr

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125

115

Arg GLY Asn GLY Phe Pro Ser Asn GLY Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu GLY Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu GLY
225 230

<210> 23

<211> 234

<212> PRT

<213> Ptilosarcus gurneyi

<400> 23

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
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20 25 30Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45Gln Ile Arg Val Thr Lys Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

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Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
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145															160
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr
															175
Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys
															190
Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	His	Arg	Leu	Glu	Lys	Thr	Tyr
															205
Val	Glu	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln
210															220
Leu	Thr	Thr	Ile	Gly	Lys	Pro	Leu	Gly	Ser						
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		20													
Met	Glu	Gly	Phe	Gly	Lys	Gly	Asn	Val	Leu	Phe	Gly	Asn	Gln	Leu	Met
		35													
Gln	Ile	Arg	Val	Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile
		50													
Val	Ser	Ile	Ala	Phe	Gln	Tyr	Gly	Asn	Arg	Thr	Phe	Thr	Lys	Tyr	Pro
					70										
Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe
				85					90						
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg
									105				110		
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr
													125		
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
		130											140		

Leu Gly Met Glu Pro Ser Phe Val Val Tyr Lys Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu
225 230 235

<210> 25
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<400> 25

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe GLY Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys GLY Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys GLY GLY Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His
225 230 235

<210> 26
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<213> Ptilosarcus gurneyi

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

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35															
Gln	Ile	Arg	Val	Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Phe	Asp	Ile
50															
Val	Ser	Ile	Ala	Phe	Gln	Tyr	Gly	Asn	Arg	Thr	Phe	Thr	Lys	Tyr	Pro
65															
Asp	Asp	Ile	Ala	Asp	Tyr	Phe	Val	Gln	Ser	Phe	Pro	Ala	Gly	Phe	Phe
85															
Tyr	Glu	Arg	Asn	Leu	Arg	Phe	Glu	Asp	Gly	Ala	Ile	Val	Asp	Ile	Arg
100															
Ser	Asp	Ile	Ser	Leu	Glu	Asp	Asp	Lys	Phe	His	Tyr	Lys	Val	Glu	Tyr
115															
Arg	Gly	Asn	Gly	Phe	Pro	Ser	Asn	Gly	Pro	Val	Met	Gln	Lys	Ala	Ile
130															
Leu	Gly	Met	Glu	Pro	Ser	Phe	Glu	Val	Val	Tyr	Met	Asn	Ser	Gly	Val
145															
Leu	Val	Gly	Glu	Val	Asp	Leu	Val	Tyr	Lys	Leu	Glu	Ser	Gly	Asn	Tyr

Ptilosarcus gurneyi. ST25.txt

175
170
165

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Val Lys
180 185 190

Glu Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu
225 230 235

<210> 27
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<213> Ptj]osarcus gurnevi

27
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5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe GLY Lys GLY Asn Val Leu Phe GLY Asn Gln Leu Met

40
45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr	Ser	Cys	His	Met	Lys	Thr	Phe	Tyr	Arg	Ser	Lys	Gly	Gly	Val	Lys
180															190
Glu	Phe	Pro	Glu	Tyr	His	Phe	Ile	His	His	Arg	Leu	Glu	Lys	Thr	Tyr
195															205
Val	Glu	Gly	Ser	Phe	Val	Glu	Gln	His	Glu	Thr	Ala	Ile	Ala	Gln	
210															220
Leu	Thr	Thr	Ile	Gly	Lys	Pro	Leu	Gly	Ser	Leu	His	Glu	Trp		
225															235